DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

OPEN FILE REPORT 78-385
FOOSE—GEOLOGIC MAP, HARRIS LAKE AREA,
NORTHEASTERN MINN.

E X P L A N A T I O N

ROCK UNITS

Plagioclase Cumulates

PC_1

Plagioclase Cumulate marker horizon
The horizon is usually between 5 and 10 m thick, medium to coarse grained, and poorly laminated. It is recognized principally by 1) along-strike continuity, 2) unusual thickness and poorly laminated character, and 3) structural position within fault blocks.

PC

Undifferentiated Plagioclase Cumulates
Most are thin, discontinuous plagioclase cumulate horizons. The rock in some areas may be correlative with the PC_1 marker bed, but the field relationships are ambiguous, and no certain correlation can be made.

Two different plagioclase cumulates are shown. Although both are lithologically identical, PC_1 represents a marker horizon that extends through much of the map area. Some of the areas shown as undifferentiated (PC) may correlate with the PC_1 bed. Most plagioclase cumulates occur as thin layers that grade downward into plagioclase-olivine cumulates and are overlain, with sharp contacts, by plagioclase-olivine cumulates (see Figure 2).

Plagioclase-Olivine Cumulates

POC

Undifferentiated Plagioclase-Olivine Cumulates
Generally these are medium to fine grained, have poorly developed ratio layering (layering that is defined by a change in the proportions of cumulus minerals) and contain little intercumulus pyroxene or oxides. Most areas shown correlate either with POC_L of POC_U; a few exposures may be part of POC_X.

POC_u

Upper Plagioclase-Olivine Cumulate
Most are medium to fine grained, have poorly developed ratio layering, and contain little intercumulus pyroxene or oxides. The unit is distinguished only by its stratigraphic position above the PC_1 marker horizon.

POC_L

Lower Plagioclase-Olivine Cumulate
This unit is virtually identical to POC_U and is recognized only by its stratigraphic position below the PC_1 marker horizon.

POC_o

Oikocrystic Plagioclase-Olivine Cumulate
A thin horizon of medium-grained, poorly laminated cumulate that contains prominent pyroxene oikocrysts up to 10 cm in diameter.

POC_x

Plagioclase-Olivine Cumulate with Intercumulus Oxides and Pyroxenes
Mostly a coarse- to medium-grained sequence of cumulates that have a well-developed ratio layering, contain relatively few interlayers of plagioclase cumulates, and usually have between 3 and 10 percent intercumulus oxides and pyroxenes.

The plagioclase-olivine cumulates may be divided into two general sequences. The lower (POC_X) is distinguished by its coarser grain size, well-developed ratio layering, relative lack of plagioclase cumulates, and abundance of interstitial oxides and pyroxenes. The upper sequence is generally finer grained, has less well developed ratio layering, hosts many small plagioclase cumulate layers, and has little intercumulus pyroxenes or oxides. The PC_1 marker horizon is used to subdivide the upper sequence into a lower part (POC_L) and an upper part (POC_U). The undifferentiated plagioclase-olivine cumulates (POC) are virtually all part of this upper sequence, and indicate areas where the stratigraphic relationships with PC_1 could not be determined. The oikocrystic cumulate (POC_O) is a thin horizon within the upper sequence.

SYMBOLS

FAULTS

Solid where certain

Dashed where less certain

Dotted where inferred

CONTACTS

Solid where known

Dashed where approximate

??? Questioned where relationships are uncertain

Strike and Dip (measured on mineral laminations or on ratio layering)

Outcrops examined

(Topographic base compiled from the Greenwood Lake 15 minute quadrangle (1954), the Gabbro Lake 15 minute quadrangle (1957), and the Babbitt NE 7 1/2 minute quadrangle (1952))

(The contour interval is 10 feet in the Greenwood Lake and Babitt NE quadrangles and 20 feet in the Gabbro Lake quadrangle)

SCALE 1:12,000
0 .5 1 KM

N
MN 3½°

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2/ MINNESOTA GEOLOGICAL SURVEY

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This report is preliminary and has not been edited for conformity with Geological Survey standards or nomenclature.

PLATE 1

PRELIMINARY GEOLOGIC MAP OF THE HARRIS LAKE AREA, NORTHEASTERN MINNESOTA

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